

C L A I M S

What is claimed and desired to be secured by Letters Patent is as follows:

1. A closure for setting engagement with a structural member and comprising:
 - (a) a substantially cylindrical body having an outer cylindrical surface relative to a central closure axis;
 - (b) a guide and advancement flange extending helically about said outer cylindrical surface and having a forward advancement direction relative to said closure axis, said flange having a leading surface and a trailing surface relative to said forward advancement direction;
 - (c) at least one of said leading surface or said trailing surface being compound in contour and including an inward anti-splay surface component facing generally toward said closure axis;
 - (d) a driving structure for rotating and torquing said body to a preselected torque; and

- (e) said body having an axially aligned bore opening on a trailing surface of said body; said bore having a left handed thread therein that is sized and shaped to be adapted to receive a removal tool with a mating left handed thread for removing said body subsequent to installation.
- 2. The closure as set forth in Claim 1 wherein said bore is exposed by removal of said driving structure.
- 3. The closure as set forth in Claim 1 wherein:
 - (a) said apertures extend from said body trailing surface partially therethrough.
- 4. The closure as set forth in Claim 1 wherein:
 - (a) said driving structure is an installation head that includes a grippable radially outer surface that is shaped to enable non-slip engagement of said installation head by an installation tool; and
 - (b) said installation head being connected to said closure by a breakaway region formed in such a manner that said breakaway region fails in

response to a selected level of torque between said installation head and said closure to enable separation of said installation head from said closure.

5. The closure as set forth in Claim 1 and including:
 - (a) said closure having a leading surface relative to said forward advancement direction; and
 - (b) said body having a V-shaped set ring and an axially aligned point formed on said leading end to enhance setting engagement of said closure into a surface of a structural member.

6. The closure as set forth in Claim 1 in combination with a bone implant screw adapted for connection to a bone fixation structural member, said bone implant screw including:
- (a) a threaded shank adapted for threaded implanting into a bone;
 - (b) an open head formed by a pair of spaced apart arms having mutually facing channel surfaces defining a structural member receiving channel therebetween to receive a bone fixation structural member; and
 - (c) said mutually facing channel surfaces each having mating guide and advancement structure formed therein which are compatible for mating with said guide and advancement flange of said closure to enable rotation guiding and advancement of said closure into said channel so as to be adapted to clamp said bone fixation structural member when positioned therein.

7. The closure and bone implant screw combination as set forth in Claim 6 wherein:
- (a) said mating guide and advancement structure of said bone implant screw include an outward anti-splay surface component which cooperates with said inward anti-splay surface component of said closure to provide an interlocking fit when joined so as to resist splaying of said arms in reaction to forces applied thereto.
8. The closure and bone screw combination as set forth in Claim 7 wherein:
- (a) said guide and advancement flange has a relatively enlarged outer periphery which forms said inward anti-splay surface component;
 - (b) said mating guide and advancement structures are contoured in a complementary manner to said guide and advancement flange to form said outward anti-splay surface component; and
 - (c) said inward anti-splay surface component engages said outward anti-splay surface component when said closure is guided and advanced into said open screw head of said bone implant screw.

9. A closure for setting engagement with a structural member and comprising:
- (a) a body having an outer cylindrical surface relative to a central closure axis and a driving installation head;
 - (b) a guide and advancement flange extending helically and substantially continuously about said outer cylindrical surface and having a forward advancement direction relative to said closure axis, said flange having a trailing surface relative to said forward advancement direction;
 - (c) said trailing surface being compound in contour and including an inward anti-splay surface component facing generally toward said closure axis; and
 - (d) said body having an axially aligned bore formed therein that opens onto a trailing surface of said body; said bore having a helically wound left handed thread therein; said bore thread being sized and shaped to receive a removal tool having a mating left handed thread.

10. The closure as set forth in Claim 9 including:
 - (a) an installation head that is shaped to enable non-slip engagement of said installation head by an installation tool; and
 - (b) said installation head being connected to said closure by a breakaway region formed in such a manner that said breakaway region fails in response to a selected level of torque between said installation head and said closure to enable separation of said installation head from said closure.

11. The closure as set forth in Claim 9 and including:
 - (a) said closure having a leading end relative to said forward advancement direction; and
 - (b) said closure having a V-shaped set ring and an axially aligned point formed on said leading end to enhance setting engagement of said closure into a surface of a structural member.

12. The closure as set forth in Claim 9 in combination with a bone implant screw adapted for connection to a bone fixation structural member, said bone implant screw including:

- (a) a threaded shank adapted for threaded implanting into a bone;
- (b) an open head having a pair of spaced apart arms having mutually facing channel surfaces defining a structural member receiving channel to receive a bone fixation structural member therebetween; and
- (c) each of said mutually facing channel surfaces having mating internal guide and advancement structure formed therein which are compatible with said flange of said closure to enable advancement of said closure into said channel to thereby clamp said bone fixation structural member when positioned therein.

13. The closure and bone implant screw combination as set forth in Claim 12 wherein:
- (a) each of said guide and advancement structures of said bone implant screw include an outward anti-splay surface component which cooperates with said inward anti-splay surface component of said closure in such a manner as to resist a tendency of said arms to splay in reaction to torquing said closure into engagement with said fixation structural member.
14. The combination as set forth in Claim 13 wherein:
- (a) said flange has a relatively enlarged outer periphery which forms said inward anti-splay surface component;
 - (b) each of said guide and advancement structures are contoured in a complementary manner to said external thread to form said outward anti-splay surface component; and
 - (c) said inward anti-splay surface component engages said outward anti-splay surface component when said closure is rotated into said open screw head of said bone implant screw.

15. A closure for setting engagement with a structural member and including a substantially cylindrical body having an outer cylindrical surface relative to a central closure axis and a substantially continuous guide and advancement flange extending helically about said outer cylindrical surface and having a forward advancement direction relative to said screw axis; said flange having a leading surface and a trailing surface relative to said forward advancement direction; at least one of said leading surface or said trailing surface being compound in contour and including an inward anti-splay surface component facing generally toward said closure axis; and said body having an axially aligned bore that opens onto a trailing surface of said body; said bore having a left handed helically wound thread sized and shaped to mate with a removal tool having a mating left handed thread.

16. The closure as set forth in Claim 15 wherein said bore extends from said trailing surface of said body only partially through said body.
17. The closure as set forth in Claim 15 and including:
 - (a) an installation head that is shaped to enable non-slip engagement of said installation head by an installation tool; and
 - (b) said installation head being connected to said closure by a breakaway region formed in such a manner that said breakaway region fails in response to a selected level of torque between said installation head and said closure to enable separation of said installation head from said closure.
18. The closure as set forth in Claim 15 wherein:
 - (a) said closure has a leading end relative to said forward advancement direction; and
 - (b) said closure having a V-shaped set ring and a point formed on said forward end to enhance setting engagement of said closure into a surface of such a structural member.

19. The closure as set forth in Claim 15 in combination with a bone screw adapted for connection to a bone fixation structural member, said bone implant screw including:
- (a) a threaded shank adapted for threaded implantation into a bone;
 - (b) an open head formed by a pair of spaced apart arms having mutually facing channel surfaces defining a structural member receiving channel to receive a bone fixation structural member;
 - (c) each of said mutually facing channel surfaces having respective mating guide and advancement structures formed therein which are compatible with said guide and advancement flange of said closure to enable guiding and advancement of said closure into said channel to thereby clamp said bone fixation structural member therein; and
 - (d) said mating guide and advancement structures of said bone implant screw including an outward anti-splay surface component which cooperates with said inward anti-splay surface component of said closure in such a manner as to resist a tendency

of said arms to splay in reaction to forces being applied thereto.

20. The closure and bone screw combination as set forth in Claim 19 wherein:

- (a) said guide and advancement flange has a relatively enlarged outer periphery region which forms said inward anti-splay surface component;
- (b) said mating guide and advancement structures are contoured in a complementary manner to said guide and advancement flange to form said outward anti-splay surface component; and
- (c) said inward anti-splay surface component engages said outward anti-splay surface component when said closure is guided and advanced into said open screw head of said bone implant screw.